

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

TCDS NUMBER 1E4

REVISION: 21

LYCOMING ENGINES

MODELS: IO-540-A1A5, -B1A5, -B1B5, -B1C5, -C1B5, -C1C5, -C2C, -C4B5, -C4B5D, -C4D5, -C4C5, -C4D5D, -D4A5, -D4B5, -D4C5, -E1A5, -E1B5, -E1C5, -G1A5, -G1B5, -G1C5, -G1D5, -G1E5, -G1F5, -J4A5, -K1A5, -K1A5D, -K1B5, -K1B5D, -K1C5, -K1D5, -K1E5, -K1E5D, -K1F5, -K1F5D, -K1G5, -K1G5D, -K1H5, -K1J5, -K1J5D, -K1K5, -K2A5, -L1A5, -L1A5D, -L1B5D, -L1C5, -M1A5, -M1A5D, -M1B5D, -M1C5, -M2A5D, -N1A5, -P1A5, -R1A5, -S1A5, -T4A5D, -T4B5, -T4B5D, -T4C5D, -U1A5D, -U1B5D, -V4A5D, -V4A5, -W1A5, -W1A5D, -W3A5D, -AA1A5, -AA1B5, -AB1A5, -AC1A5, -AE1A5

MODEL HIO-540-A1A

MODEL AEIO-540-D4A5, -D4B5, -D4C5, -D4D5, -L1B5D, -L1B5, -L1D5

December 17, 2003

TYPE CERTIFICATE DATA SHEET NO. 1E4

Engines of models described herein conforming with this data sheet (which is a part of Type Certificate No. 1E4) and other approved data on file with the Federal Aviation Administration meet the minimum standards for use in certificated aircraft in accordance with pertinent aircraft data sheets and applicable portions of the Civil Air Regulations/Federal Aviation Regulations provided they are installed, operated and maintained as prescribed by the approved manufacturer's manuals and other approved instructions.

Type Certificate Holder:

Lycoming Engines
An Operating Division of AVCO Corporation
Williamsport, Pennsylvania 17701

Type Certificate Holder Record

Textron Lycoming transferred TC 1E4 to Lycoming Engines, An Operating Division of AVCO Corporation on December 17, 2003

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Rev No.	21	16	18	19	16	19	19	19	19	19	19	19

I. Models: IO-540	A1A5, -B1A5, -B1B5, B1C5, -E1A5, -E1B5, -E1C5, G1A5, -G1B5, -G1C5, -G1D5, G1E5, -G1F5, -P1A5, H1O-540-A1A	-C1B5, -C1C5, -C2C, -C4B5, -C4C5, -J4A5, -C4D5D -C4D5 -C4B5D	-W1A5D, -W3A5D -W1A5	+AA1A5 -AA1B5
Type	6HOA DIRECT DRIVE	--	--	--
Rating Takeoff and maximum continuous hp., rpm, full throttle at: Sea level pressure altitude	290-2575	250-2575	235-2400	270-2700 SEE NOTE 8
+Alternate Rating 250-2425-S.L.				
Fuel (Minimum grade aviation gasoline)	100/100LL*	--	--	--
Injection	SEE NOTE 5	--	--	--
Pump drive	SEE NOTE 3	--	--	--
Oil Lubrication (Lubricants should conform to the specifications as listed or to subsequent revisions thereto.)	Lycoming Specification No. 301-E and Service Instruction No. 1014	--		
Oil sump capacity, qt.	12	--	8	12
Usable oil qt., Normal operation	9.25	--	6.0	9.25
20° nose up or down (except AEIO))	9.25	--	6.0	9.25
30° nose up or down (except AEIO)	8.0	--	6.0	8.0
30° nose up (AEIO only)	#	#	#	#
18° nose down (AEIO only)	#	#	#	#
Inverted flight (AEIO only)	#	#	#	#
Ignition, dual	#	#	#	#
Magnetos	SEE NOTE 9	--	--	--
Timing °BTC	20	25	23	20
Spark plugs	SEE NOTE 4	--	--	--
Compression				
Bore and stroke, in.	5.125 X 4.375	--	--	--
Displacement, cu. in.	541.5	--	--	--
Compression ratio	8.7:1	8.5:1	8.5:1	7.3:1
Turbo-supercharger	#	SEE NOTE 8	#	SEE NOTE 8
Weight (dry), lb.	SEE NOTE 5	--	--	--
C.G. location	SEE NOTE 9	--	--	--
Propeller shaft - Specification A.S. 127	Type 2 Flange Modified	--	--	--
Crankshaft dampers (torsional)	SEE NOTE 7	--	--	--
NOTES	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5,6,7	1,2,3,4,5, 6,7,8,9,10, 11

"- "- indicates "same as preceding"

"#" indicates "does not apply"

*See latest revision of Lycoming Service Instruction No. 1070 for alternate fuel grades

II. MODELS: IO-540-	-K1A5, -K1A5D, +-K1B5, -K2A5, -K1B5D, +-K1C5, +-K1D5, -K1E5, -K1E5D, +-K1F5, -K1F5D, -K1G5, -K1G5D, -K1H5, +-K1J5, +-K1J5D, -K1K5, -L1A5, -L1A5D, -L1B5D, -L1C5, -M1A5, -M1A5D, -M1B5D, - M1C5, -M2A5D, -S1A5, -U1A5D, -U1B5D	AEIO-540-L1B5D, AEIO-540-L1B5, AEIO-540-L1D5	IO-540 -D4A5, -D4B5, -D4C5, -N1A5, -R1A5, -D4A5 AEIO-540- -D4A5, -D4B5, -D4C5 -D4D5	IO-540- -T4A5D, -T4B5, -T4B5D, -T4C5D, -V4A5D
Type Rating Takeoff and maximum continuous hp., rpm, full throttle at: sea level pressure altitude + Alternate Rating 290 - 2575 - S.L. Fuel (minimum grade aviation gasoline) Injection Pump drive Oil, lubrication (Lubricants should conform to the specifications as listed or to subsequent revisions thereto.) Oil sump capacity, qt. Usable oil qt., Normal operation 20° nose up or down (except AEIO) 30° nose up or down (except AEIO) 30° nose up (AEIO only) 18° nose down (AEIO only) Inverted flight (AEIO only) Ignition, dual Magnetos Timing, °BTC Spark Plugs Compression Bore and stroke, in. Displacement, cu. in. Compression ratio Turbo-supercharger Weight (dry), lb. C.G. location Propeller shaft - Specification A.S. 127 Crankshaft dampers (torsional) NOTES	6HOA DIRECT DRIVE 300-2700 100/100LL* See NOTE 5 See NOTE 3 Lycoming Specification No. 301-E and Service Instruction No. 1014. 12 9.25 9.25 8.0 # # # # # # SEE NOTE 9 20 SEE NOTE 4 5.125 X 4.375 541.5 8.7:1 # SEE NOTE 5 SEE NOTE 9 Type 2 Flange Modified See NOTE 7 1,2,3,4,5,6,7,9,10,11	-- 300-2700 -- -- -- 16 8.0 # # 8.0 (37° up, 20° down) 7.0 (25° down 8.0 -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- -- --	-- 260-2700 -- -- -- 12 9.25 9.25 8.0 6.0 6.0 6.0 6.0 25 -- -- -- -- -- -- -- -- -- -- -- 1,2,3,4,5, 6,7,8,9,10, 11	-- 260-2700 -- -- -- 8 6.0 6.0 6.0 # -- -- -- # # -- -- -- -- -- 1,2,3,4,5, 6,7,8,9, 10,11

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*See latest revision of Lycoming Service Instruction No. 1070 for alternate fuel grades

I. Models: IO-540	AB1A5	-AC1A5	-AE1A5
Type	6HOA DIRECT DRIVE	--	--
Rating			
Maximum continuous hp., rpm, in. Hg	230-2400 – FT	300 – 2700 - FT	235 – 2800 – 24.5
Takeoff (5 min) hp., rpm, in. Hg	#	#	260 – 2800 – 26.2
Fuel			
(Minimum grade aviation gasoline)	100/100LL*	--	--
Injection	SEE NOTE 5	--	--
Pump drive	SEE NOTE 3	--	--
Oil Lubrication			
(Lubricants should conform to the specifications as listed or to subsequent revisions thereto.)	Lycoming Specification No. 301-E and Service Instruction No. 1014	--	--
Oil sump capacity, qt.	8	11	12
Usable oil qt., Normal operation	6.0	5 ½	2 ¾
20° nose up or down (except AEIO))	6.0	5 ½	
30° nose up or down (except AEIO)	6.0	5 ½	
30° nose up (AEIO only)	#	--	
18° nose down (AEIO only)	#	--	
Inverted flight (AEIO only)	#	--	
Ignition, dual	#	--	
Magnetos	SEE NOTE 9	--	--
Timing °BTC	23	20	--
Spark plugs	SEE NOTE 4	--	--
Compression			
Bore and stroke, in.	5.125 X 4.375	--	--
Displacement, cu. in.	541.5	--	--
Compression ratio	8.5:1	8.7:1	--
Turbo-supercharger	#	--	--
Weight (dry), lb.	SEE NOTE 5	--	--
C.G. location	SEE NOTE 9	--	--
Propeller shaft - Specification	Type 2 Flange Modified	--	--
A.S. 127			
Crankshaft dampers (torsional)	SEE NOTE 7	--	--
NOTES	1,2,3,4,5,6,7	--	--

"- -" indicates "same as preceding"

"#" indicates "does not apply"

*See latest revision of Lycoming Service Instruction No. 1070 for alternate fuel grades

Certification basis:

Regulations & Amendments	Model	Date of Application	Date Type Certificate No. 1E4 Issued/Revised
CAR 13 effective June 15, 1956 As Amended by 13-1, 13-2, 13-3	IO-540-B1A5	January 7, 1960	May 5, 1960
	IO-540-B1B5	June 1, 1960	June 9, 1960
	IO-540-A1A5	April 6, 1961	June 30, 1961
	IO-540-C1B5	July 6, 1961	January 2, 1962
	IO-540-E1A5	April 6, 1962	June 15, 1962
	IO-540-B1C5	April 18, 1963	May 20, 1963
	IO-540-C1A5	August 9, 1963	August 21, 1963
	IO-540-C4B5	October 3, 1963	October 9, 1963
	IO-540-C1C5	December 2, 1963	December 31, 1963
	IO-540-C2C	December 17, 1963	December 31, 1963
Cancelled -	IO-540-C1A5	-----Cancelled -	March 6, 1964
	IO-540-D4A5	April 1, 1964	May 4, 1964
	IO-540-J4A5	December 23, 1964	May 7, 1965
	IO-540-K1A5	August 10, 1965	February 9, 1966
	IO-540-E1B5	March 11, 1966	March 29, 1966
	IO-540-G1B5	May 16, 1966	July 8, 1966
	IO-540-K1B5	July 8, 1966	July 22, 1966
	IO-540-M1A5	August 18, 1966	January 27, 1967
	IO-540-C4C5	August 31, 1966	September 2, 1966
	IO-540-G1C5	September 21, 1966	October 14, 1966
	IO-540-L1A5	November 2, 1966	May 23, 1967
	IO-540-G1D5	December 20, 1966	January 27, 1967
	IO-540-G1E5	May 16, 1967	May 26, 1967
	IO-540-E1C5	March 8, 1968	March 14, 1968
	IO-540-N1A5	November 19, 1968	December 5, 1968
	IO-540-P1A5	December 4, 1968	December 9, 1968
	IO-540-K1C5	March 24, 1969	March 25, 1969
	IO-540-K1D5	August 29, 1969	September 4, 1969
	IO-540-R1A5	September 29, 1969	October 6, 1969
	IO-540-G1F5	March 5, 1970	March 11, 1970
	IO-540-K1E5	November 24, 1970	December 7, 1970
	IO-540-K1E5D	October 12, 1972	October 21, 1972
	IO-540-M2A5D	January 4, 1973	January 16, 1973
	IO-540-D4B5	March 13, 1973	March 20, 1973
	IO-540-K1F5	May 16, 1973	May 25, 1973
	IO-540-S1A5	May 16, 1973	May 25, 1973
	IO-540-K1F5D	May 17, 1973	May 30, 1973
	HIO-540-A1A	June 18, 1973	March 5, 1974
	IO-540-K1A5D	May 1, 1974	June 3, 1974
	IO-540-K1B5D	May 1, 1974	June 3, 1974
	IO-540-D4C5	October 30, 1974	November 8, 1974
	AEIO-540-D4A5	November 12, 1974	November 26, 1974
	AEIO-540-D4B5	November 12, 1974	November 26, 1974
	AEIO-540-D4C5	November 12, 1974	November 26, 1974
	IO-540 T4A5D	April 17, 1975	April 28, 1975
	IO-540-U1A5D	June 2, 1975	June 12, 1975
	IO-540-K1G5	September 10, 1975	September 24, 1975
	IO-540-K1G5D	September 10, 1975	September 24, 1975
	IO-540-U1B5D	September 30, 1975	October 23, 1975
	IO-540-K1H5	November 12, 1975	December 10, 1975
	IO-540-K1J5	November 12, 1975	December 10, 1975
	IO-540-K1J5D	November 12, 1975	December 10, 1975
	IO-540-T4B5D	September 20, 1976	September 23, 1976
	IO-540-V4A5D	July 11, 1978	July 21, 1978
	IO-540-L1A5D	September 28, 1978	October 6, 1978
	IO-540-M1A5D	January 22, 1979	January 26, 1979
	IO-540-M1B5D	November 15, 1979	November 29, 1979
	IO-540-C4D5D	March 4, 1980	March 13, 1980

Certification Basis (cont'd)

Regulations & Amendments	Model	Date of Application	Date Type Certificate No. 1E4 Issued Revised
CAR 13 effective June 15, 1956 As Amended by 13-1, 13-2, 13-3	IO-540-W1A5D	May 6, 1980	June 2, 1980
	IO-540-AA1A5	September 10, 1980	October 30, 1980
	AEIO-540-L1B5D	December 16, 1980	February 27, 1981
	IO-540-K1K5	June 9, 1981	June 23, 1981
	IO-540-W3A5B	March 11, 1985	June 6, 1985
	IO-540-L1C5	May 7, 1985	June 17, 1985
	IO-540-T4C5D	January 12, 1987	January 20, 1987
	AEIO-540-L1B5	June 1, 1989	June 22, 1989
	IO-540-L1B5D	February 12, 1987	February 20, 1987
	IO-540-T4B5	October 29, 1989	November 3, 1989
	IO-540-K2A5	February 19, 1990	March 29, 1990
	IO-540-C4D5	May 15, 1990	June 20, 1990
	IO-540-AA1B5	February 19, 1992	February 28, 1992
	IO-540-W1A5	June 29, 1992	August 12, 1992
	IO-540-M1C5	December 11, 1992	December 18, 1992
	IO-540-C4B5D	December 23, 1992	February 26, 1993
	IO-540-V4A5	October 25, 1995	June 18, 1996
	IO-540-AB1A5	April 15, 1996	June 18, 1996
	AEIO-540-D4D5	July 9, 1996	July 24, 1996
	IO-540-AC1A5	April 3, 1998	May 27, 1998
	AEIO-540-L1D5	April 24, 2001	August 1, 2001
	IO-540-AE1A5	November 9, 2001	January 22, 2002

Production basis: Production Certificate No. 3

NOTE 1. Temperature Limits (Maximum permissible):

Cylinder head (well type thermocouple)	500°F
Cylinder base	325°F Cylinder base temperature limits are not applicable to engine models which incorporate internal piston cooling oil jets.
Oil inlet	245°F
Air inlet to injector	See NOTE 8

NOTE 2. Pressure Limits:

	p.s.i. at inlet to fuel pump	
	<u>Maximum</u>	<u>Minimum</u>
Fuel:		
IO-540-C1B5-C1C5,-C2C,-C4B5,-C4B5D-C4C5,-C4D5,-D4A5,D4B5,-D4C5, -N1A5,-T4A5D,-T4B5,-T4B5D; AEIO-540-D4A5,-D4B5,-D4C5,-D4D5; IO-540-L1C5,-C4D5D,-T4C5D,-V4A5D,-V4A5,-W1A5D,-W1A5,-W3A5D, -AB1A5,-AC1A5,-AE1A5	35	-2
IO-540-J4A5 -M2A5D,-R1A5,-M1A5D,-M1B5D,	45	-2
IO-540-L1A5	55	-2
IO-540-E1C5,-G1B5,-G1C5,-G1D5,-K1A5,-K1A5D,-K1B5,-K1B5D, -K1D5,-K1F5,-K1F5D,-K1G5,-K1G5D,-K1H5,-K1J5,-K1J5D,-K1K5, -K2A5,-L1A5,-L1A5D,-L1B5D,-M1A5,-M1C5,-P1A5,-S1A5,-U1A5D, -U1B5D-AA1A5, H10-540-A1A; AEIO-540-L1B5D,-L1B5, L1D5	40	-2

	p.s.i. at inlet to fuel injector		Minimum Idle	Max. Injector in Idle cutoff
	Maximum	Minimum		
IO-540-A1A5,-B1A5,-B1C5,-E1A5,-E1B5,-G1A5,-G1E5,-G1F5, -K1C5,-K1E5,-K1E5D	26	20	#	#
IO-540-B1B5	5	2	#	#
IO-540-AB1A5,-C1B5,-C1C5,-C2C,-C4B5,-C4C5,-C4D5,-C4D5D, -D4A5,-D4B5,-D4C5,-J4A5,-N1A5,-R1A5,-T4A5D,-T4B5,-T4B5D, -T4C5D,-V4A5D,-V4A5,-V1A5,-W1A5D,-W3A5D; AEIO-540-D4A5,-D4B5,-D4C5,-D4D5	45	14	12	55
IO-540-E1C5,-G1B5,-G1C5,-G1D5,-K1A5,-K2A5,-K1A5D,-K1B5, -K1B5D,-K1D5,-K1F5,-K1F5D,-K1G5,-K1G5D,-K1H5,-K1J5,-K1J5D, -L1A5,-P1A5,-S1A5,-U1A5D,-U1A5D,-U1B5D; AA1A5,-AA1B5,-AC1A5,- AE1A5,-L1A5D,-L1B5D,-K1K5,-M1A5; AEIO-540-L1B5D,-L1B5, L1D5; HIO-540-A1A	40	18	12	55
IO-540-M1A5,-M2A5D,-M1A5D,-M1B5D	45	18	12	55
IO-540-L1A5,-L1C5	55	18	12	55

Oil:	<u>Maximum</u>	<u>Minimum</u>
Normal operation	95 p.s.i.	55 p.s.i.
Idling	#	25 p.s.i.
Starting, warm-up, Taxi and Take off	115 p.s.i.	#

"#" indicates does not apply

NOTE 3. Accessory Drive Provisions: For additional information on engine drives, refer to Textron Lycoming Operator's Manual.

Accessory	Rotation Facing Drive pad	Speed Ratio to Crankshaft	Maximum Torque (in.-lb.)		Maximum Overhung Moment (in.-lb.)
			Continuous	Static	
Starter	CC	16.556:1	#	450	150
Generator	C	1.910:1	60	120	175
Generator	C	2.500:1	60	120	175
Alternator	C	3.200:1	60	120	175
Alternator	C	3.630:1	60	110	175
Vacuum pump	CC	1.300:1	70	450	25
Hydraulic pump	C	1.385:1	100	800	40
Hydraulic pump	C	0.480:1	100	800	40
Hydraulic pump	C	1.300:1	100	800	40
Hydraulic pump	C	1.300:1	180	2200	150
Tachometer	C	0.500:1	7	50	5
Prop governor	C	0.895:1	125	1200	25
Prop governor	C	0.947:1	125	2200	25
Fuel pump	Plunger	0.500:1	#	#	10
Fuel pump	CC	1.000:1	25	450	25
Fuel pump	C	1.000:1	25	450	25

"#" indicates: Does not apply.

"C" Clockwise, "CC" Counter-Clockwise

Fuel pump drive pad used for fuel injector drive on Model IO-540-B1B5

"Narrow deck" engines have a propeller governor drive ratio of 0.895:1 and "wide deck" engines have a 0.947:1 ratio.

NOTE 4. Spark Plugs: See latest revision of Lycoming Service Instruction no. 1042 for approved equipment

NOTE 5. Model similarities and differences:

	<u>Models</u>	<u>Weight *</u> <u>(dry) lb.</u>	<u>Fuel Injection **</u>	<u>Characteristics</u>
IO-540	-A1A5	414	PAC RSA-10ED1	Basic model - 6 cylinder, - horizontally opposed aircooled direct drive, with fuel injection, tuned induction, downdraft cooling and bottom side exhaust ports.
	-AA1A5	448	PAC RSA-10ED1	Same as -S1A5 except has low compression (7.3:1) ratio pistons.
	-AA1B5	448	PAC RSA-10ED1	Same as -AA1A5 except uses a Slick pressurized impulse magneto instead of a retard magneto.
	-AB1A5	372	PAC RSA-5AD1	Similar to IO-540-W1A5 Except has more effective counterweights , two Slick impulse magnetos and the fuel injector is located on the bottom of the sump
	-AC1A5	444	PAC RSA-10ED1	Similar to IO-540-K1C5 except top intake down exhaust
	-AE1A5	416	PAC RSA-10ED1	Similar to O-540-F1B5 with IO-540-K angle valve cylinders, pistons, piston squirts and fuel injection and induction system
	-B1A5	411	PAC RS-10B1	Same as -A1A5 except has updraft cooling air and top side exhaust ports.
	-B1B6	406	Simmonds 530	Same as -B1A5 except has a Simmonds fuel injector.
	-B1C5	411	PAC RS-10B1	Same as -B1A5 except servo-bleed removed from PAC injector servo vent.
	-C1B5	374	PAC RSA-5AD1	Differs from A & B series in that it has parallel valve cylinders, untuned induction system, an RSA-5AD1 PAC fuel injector mounted on the bottom of the sump and a diaphragm fuel pump.
	-C1C5	373	PAC RSA-5AD1	Similar to -C1B5 except accessory housing converted with an AN fuel pump drive to provide for turbocharging.
	-C2C	373	PAC RSA-5AD1	Similar to -C1B5 except has two 6th order dampers and S6LN-21, S6LN-20 TCM magnetos and an AN fuel pump drive.
	-C4B5	374	PAC RSA-5AD1	Similar to -C1B5 except incorporates heavier crankshaft counterweights, eligible for use with Hartzell compact propeller.
	-C4D5	373	PAC RSA-5AD1	Similar to -C4B5 except uses an impulse magneto in place of the retard breaker magneto.
	-C4D5D	379	PAC RSA-5AD1	Similar to -C4B5 except has a TCM D6LN-2031 impulse coupling dual magneto.
	-C4C5	373	PAC RSA-5AD1	Same as -C1C5 except incorporates heavier crankshaft counterweights, eligible for use with Hartzell compact propeller.
	-C4B5D	379	PAC RSA-5AD1	Similar to C4D5D except has retard breaker magneto instead of an impulse magneto.
	-D4A5	379	PAC RSA-5AD1	Similar to -C4B5 except for hybrid camshaft.
	-D4B5	381	PAC RSA-5AD1	Same as -D4A5 except has TCM S1200 series magnetos with impulse coupling instead of S-200 series with retard breaker.
	-D4C5	380	PAC RSA-5AD1	Same as -D4B5 except has a S6LN-1208 magneto instead of S6LN-1277 magneto.
	-E1A5	411	PAC RS-10B1	Same as -B1A5 except has internal piston cooling oil jets, thereby increasing maximum heat rejected to oil to 1150 BTU per minute.
	-E1B5	412	PAC RS-10B1	Same as -E1A5 except has TCM S6LN-1208 and -1209 magnetos.
	-E1C5	416	PAC RSA-10ED1	Same as -E1B5 except for fuel injector.
	-G1A5	416	PAC RS-10ED1	Similar to -A1A5 except has internal piston cooling oil jets thereby increasing maximum heat rejected to oil to 1150 BTU per minute.
	-G1B5	419	PAC RSA-10ED1	Similar to -G1A5 except incorporates TCM 1200 series magnetos and different fuel control.
	-G1C5	420	PAC RSA-10ED1	Similar to -G1B5 and -G1D5 but has a 38 1/2° angle fuel injector adapter.
	-G1D5	420	PAC RSA-10ED1	Similar to -G1B5 except TCM S6LN-1227 impulse coupling magneto on left side.

* Less starter and alternator

** Precision Airmotive Corp. (PAC) formally Bendix

NOTE 5. Model similarities and differences: (cont'd)

	<u>Models</u>	<u>Weight *</u> <u>(dry) lb.</u>	<u>Fuel Injection **</u>	<u>Characteristics</u>
IO-540	-G1E5	417	PAC RS-10ED1	Same as -G1A5 except incorporates TCM 1200 series high altitude magnetos.
	-G1F5	418	PAC RS-10ED1	Same as -G1E5 except has different magneto models.
	-J4A5	380	PAC RSA-5AD1	Differs from -C4B6 by particulars adapting it for possible turbocharger.
	-K1A5	438	PAC RSA-10ED1	Similar to -G1A5 except has TCM S6LN-1209 and 1227 magnetos, a PAC RSA-10ED1 fuel injector mounted 38 1/2° left of rear and a stiffer crankshaft.
	-K1A5D	439	PAC RSA-10ED1	Same as -K1A5 except equipped with a D6LN-2031 dual magneto.
	-K1B5	438	PAC RSA-10ED1	Same as -K1A5 except that it has a straight air inlet housing.
	-K1B5D	439	PAC RSA-10ED1	Same as -K1B5 except equipped with a D6LN-2031 dual magneto.
	-K1C5	438	PAC RS-10ED1	Similar to the -K1A5 has different magnetos, different fuel injector and a straight air inlet adapter.
	-K1D5	442	PAC RSA-10ED1	Similar to -K1B5 except has different magnetos and a flange fuel injector inlet coupling.
	-K1E5	439	PAC RS-10ED1	Same as -K1B5 except has different fuel injector.
	-K1E5D	435	PAC RS-10ED1	Same as -K1E5 except has TCM D-2000 series, impulse coupling dual magneto.
	-K1F5	442	PAC RSA-10ED1	Same as -G1B5 but with IO-540-K series rotating system.
	-K1F5D	438	PAC RS-10ED1	Same as -K1F5 but with TCM D-2000 series, retard breaker dual magneto.
	-K1G5	437	PAC RSA-10ED1	Same as -K1A5 except equipped with a diaphragm type fuel pump and drive.
	-K1G5D	438	PAC RSA-10ED1	Same as -K1A5D except equipped with a diaphragm type fuel pump and drive.
	-K1H5	437	PAC RSA-10ED1	Same as -K1B5 except equipped with a diaphragm type fuel pump and drive.
	-K1J5	441	PAC RSA-10ED1	Same as -K1F5 except equipped with a diaphragm type fuel pump and drive.
	-K1J5D	437	PAC RSA-10ED1	Same as -K1F5D except equipped with a diaphragm type fuel pump and drive.
	-K1K5	438	PAC RSA-10ED1	Same as -K1A5 except has high crush main bearings and crankcase rear oil drain holes.
	-K2A5	438	PAC RSA-10ED1	Similar to -K1A5 except incorporates different propeller flange bushings.
	-L1A5	441	PAC RSA-10AD1	Same as -K1A5 except for induction system housing and fuel injector mounted to the front.
	-L1A5D	437	PAC RSA-10AD1	Same as -L1A5 except has a TCM D6LN-2031 impulse coupling dual magneto.
	-L1B5D	470	PAC RSA-10AD1	Same as AEIO-540-L1B5D except not equipped with aerobatic components
	-L1C5	440	PAC RSA-10AD1	Same as -L1A5 except equipped with a diaphragm type fuel pump.
	-M1A5	436	PAC RSA-10AD1	Similar to -K1B6 except has up exhaust, different PAC injector, different length ignition harness and ni-resist exhaust valve guides.
	-M1A5D	435	PAC RSA-10AD1	Same as -M2A5D except has provisions for a controllable propeller.
	-M1B5D	436	PAC RSA-10EA1	Similar to -M1A5D except has impulse magneto, straight inlet fuel injector adapter and a diaphragm type fuel pump.
	-M1C5	437	PAC RSA-10AD1	Similar to -M1A5 except has impulse magneto instead of a retard magneto.
	-M2A5D	435	PAC RSA-10AD1	Same as -M1A5 except has TCM D-2000 series magneto instead of S-1200 series magnetos.

* Less starter and alternator

** Precision Airmotive Corp. (PAC) formally Bendix

NOTE 5. Model similarities and differences: (cont'd)

	<u>Models</u>	<u>Weight *</u> <u>(dry) lb.</u>	<u>Fuel Injection **</u>	<u>Characteristics</u>
IO-540	-N1A5	397	PAC RSA-5AD1	Similar to the -D4A5 except has a stiffer crankshaft and heavier 5th and 6th order dampers thereby being eligible for use with an extended hub propeller.
	-P1A5	424	PAC RSA-10ED1	Similar to the -G1B5 except incorporates a larger engine oil pump and suitable for turbocharging.
	-R1A5	406	PAC RSA-5AD1	Similar to -N1A5 except has different magnetos and is suitable for turbocharging. Incorporates piston cooling oil jets.
	-S1A5	444	PAC RSA-10ED1	Same as -P1A5 but with IO-540-K series rotating system.
	-T4C5D	393	PAC RSA-5AD1	Same as -T4B5D except equipped with TCM retard breaker dual magneto and has a maximum oil capacity of 10 quarts.
	-T4A5D	381	PAC RSA-5AD1	Same as -D4B5 except has horizontal rear inlet fuel injector and equipped with a D6LN-2031 dual magneto.
	-T4B5D	381	PAC RSA-5AD1	Same as -T4A5D except for fuel drain boss location.
	-T4B5	387	PAC RSA-5AD1	Similar to -T4B5D except is equipped with two Slick magnetos in place of the TCM dual magneto.
	-U1A5D	423	PAC RSA-10ED1	Same as -L1A5 except has top-side exhaust port cylinder heads and equipped with a D6LN-2031 dual magneto.
	-U1B5D	422	PAC RSA-10ED1	Same as -J1A5D except equipped with a diaphragm type fuel pump and drive.
	-V4A5D	383	PAC RSA-5AD1	Similar to -T4B5D except equipped with a front mounted fuel injector instead of a rear inlet fuel injector.
	-V4A5	389	PAC RSA-5AD1	Similar to -V4A5D except is equipped with two Slick magnetos in place of the TCM dual magneto.
	-W1A5D	369	PAC RSA-5AD1	Similar to O-540-J1A5D (TC-E295) except equipped with oil sump, intake pipes, and fuel injection system from the -V4A5D.
	-W1A5	369	PAC RSA-5AD1	Similar to -W1A5D except is equipped with two Slick magnetos in place of the TCM dual magneto.
	-W3A5D	370	PAC RSA-5AD1	Same as -W1A5D except has heavier crankshaft counterweights.
	HIO-540-A1A	443	PAC RSA-10ED	Same as IO-540-K1A5 except to be used in helicopter application.
	AEIO-540-D4A5	384	PAC RSA-5AD1	Same as IO-540-D4A5 except equipped with an inverted oil system kit for aerobatic flight.
	-D4B5	386	PAC RSA-5AD1	Same as IO-540-D4B5 except equipped with an inverted oil system kit for aerobatic flight.
	-D4C5	385	PAC RSA-5AD1	Same as IO-540-D4C5 except equipped with an inverted oil system kit for aerobatic flight.
	-D4D5	386	PAC RSA-5AD1	Same as AEIO-540-D4A5 except AN type fuel pump
	-L1B5D	445	PAC RSA-10AD1 or RSA-10DB1 (Opt.)	Similar to IO-540-L1A5D except equipped with an inverted oil system and modified oil sump for aerobatic flight.
	-L1B5	449	PAC RSA-10AD1 or RSA-10DB1 (Opt.)	Same as AEIO-540-L1B5D except is equipped with two Slick magnetos in place of the TCM dual magneto.
	-L1D5	449	PAC RSA-10AD1 or RSA-10DB1 (Opt.)	Same as AEIO-540-L1B5 except has larger capacity oil pump.

* Less starter and alternator

** Precision Airmotive Corp. (PAC) formally Bendix

NOTE 6. Accessories and Equipment:

Starter, generators and alternators approved for use on these engines are listed in the latest revisions of Textron Lycoming Service Instruction No. 1154.

NOTE 7. These engines incorporate crankshafts with one fifth order and one sixth order dampers unless the number "5" is omitted in the fourth position of the model designation, i.e. -C2C which has two sixth order dampers. These engines also have variations in crankshafts and counterweights; therefore, for approved engine and propeller combinations refer to the specific propeller and aircraft TC data sheets.

NOTE 8. Engine models IO-540-J4A5 and -R1A5 are eligible for turbocharging and under these conditions, the following additional limits apply: intake air manifold pressure max. 29.0 in. Hg. absolute exhaust back pressure max. 32 in. Hg. absolute at inlet to turbocharger for -J4A5; (33.5 in. Hg. for -R1A5); air inlet temperature to injector max. 400 degrees F. Engine model IO-540-AA1A5 is eligible for turbocharging when equipped in accordance with Piper Aircraft Corporation installation Drawing No. 300076 and under these conditions the following additional modified limits apply: intake air manifold pressure max. 37.0 in. Hg. absolute at 2425 r.p.m.; exhaust back pressure max. 43 in. Hg. absolute at intake to turbocharger; air inlet temperature to injector max. 400 degrees F; and fuel pressure limits to the injector are 21 to 40 p.s.i.

NOTE 9. For all models - ignition and center of gravity:

Models		Ignition, dual* +	C.G. location (dry with starter and generator installed)		
			From front face of propeller mounting flange (in.)	Off prop. shaft C.L. (in.) Vertical	Lateral
IO-540	-A1A5, -B1B5, -B1A5, -B1C5 -C1B5, -C1C5, -C4B5, -C4C5 -C2C, C4D5 -C4D5D -D4A5 -D4B5 -D4C5 -E1A5 -E1B5, -E1C5 -G1A5 -G1B5 -G1C5, -G1D5 -G1E5 -G1F5 -J4A5 -K1A5, -K1B5, -K1K5, -K2A5 -K1A5D -K1B5D -K1C5, -K1D5 -K1E5 -T4C5D -K1E5D, -L1A5D -K1F5, -AA1A5 -K1F5D -K1G5, -K1H5 -K1G5D -M1B5D -K1J5 -K1J5D -L1A5, -L1C5	TCM S6LN-200, S6LN-204 TCM S6LN-200, S6LN-204 or Slick 675, 674 TCM S6LN-21, S6LN-20 TCM D6LN-2031 or 3000 TCM S6LN-200, S6LN-204 TCM S6LN-1227, S6LN-1209 TCM S6LN-1208, S6LN-1209 TCM S6LN-200, S6LN-204 TCM S6LN-1208, S6LN-1209 TCM S6LN-200, S6LN-204 TCM S6LN-1208, S6LN-1209 TCM S6LN-1227, S6LN-1209 TCM S6LN-1208, S6LN-1209 TCM S6LN-1227, S6LN-1209 or S6LN-1209 TCM S6LN-1208, S6LN-1209 TCM S6LN-1227, S6LN-1227 or S6LN-1209 TCM D6LN-2031 or 3000 TCM D6LN-2031 or 3000 TCM S6LN-200, S6LN-204 TCM S6LN-1227, S6LN-1209 or S6LN-1227 TCM D6LN-3200 TCM D6LN-2031 or 3000 TCM S6LN-1208, S6LN-1209 TCM D6LN-2230 or 3200 TCM S6LN-1227, S6LN-1209 or S6LN-1227 TCM D6LN-2031 or 3000 TCM D6LN-2031 or 3000 TCM S6LN-1208, S6LN-1209 TCM D6LN-2230 or 3200 TCM S6LN-1227, S6LN-1209	18.34 18.16 18.16 18.16 18.16 18.16 18.34 18.34 18.34 18.34 18.44 18.34 18.34 18.16 18.25 18.25 18.25 18.25 18.36 18.25 18.25 18.25 18.25 18.25 13.29 18.25 18.25 17.91	1.41 below 1.15 below 1.15 below 1.15 below 1.15 below 1.15 below 1.41 below 1.41 below 1.41 below 0.98 below 0.98 below 1.41 below 1.41 below 1.15 below 0.88 below 0.88 below 0.88 below 0.88 below 0.88 below 0.88 below 0.88 below 0.88 below 0.88 below 0.89 below 0.88 below 0.88 below 0.88 below	0.18 left 0.21 left 0.21 left 0.21 left 0.21 left 0.21 left 0.21 left 0.18 left 0.18 left 0.18 left 0.03 left 0.03 left 0.18 left 0.18 left 0.21 left 0.16 right 0.16 right 0.16 right 0.16 right 0.16 right 0.16 right 0.17 right 0.16 right 0.16 right 0.16 right

*For alternate magnetos see latest Textron Lycoming Service Instruction (S.I.) 1443.

+ TCM formerly Bendix

NOTE 9. For all models - ignition and center of gravity: (cont'd)

			C.G. location (dry with starter and generator installed)		
Models		Ignition, dual* +	From front face of propeller mounting flange (in.)	Off prop. shaft C.L. (in.)	
				Vertical	Lateral
IO-540	-M1A5	TCM S6LN-1208, S6LN-1209	18.29	0.89 below	0.17 right
	-M2A5D,-M1A5D	TCM D6LN-2230 or 3200	18.29	0.89 below	0.17 right
	-N1A5	TCM S6LN-200, S6LN-204	17.76	1.10 below	0.12 left
	-P1A5	TCM S6LN-1208, S6LN-1209	18.44	0.98 below	0.03 left
	-R1A5	TCM S6LN-1208, S6LN-1209	17.76	1.10 below	0.12 left
	-S1A5	TCM S6LN-1208, S6LN-1209	18.25	0.88 below	0.16 right
	-T4A5D,-T4B5D	TCM D6LN-2031 or 3000	18.36	1.08 below	0.17 left
	-T4B5	Slick 6251, 6250 or 6251	18.36	1.08 below	0.17 left
	-U1A5D,-U1B5D	TCM D6LN-2031 or 3000	17.91	0.88 below	0.16 right
	-V4A5D	TCM D6LN-2031 or 3000	17.25	0.50 below	0.25 left
	-V4A5	Slick 6351, 6350	17.25	0.50 below	0.25 left
	-W1A5D,-W3A5D	TCM D6LN-3000	17.60	0.77 below	0.20 left
	-W1A5	Slick 6361, 6350	17.60	0.77 below	0.20 left
	-AB1A5	Slick 6351 (2)	17.60 (#)	0.77 below	0.20 left
	-AA1B5	Slick 6360, 6361	18.25	0.88 below	0.16 right
	-AC1A5	Slick 6351 (2)	18.03 (#)	0.13 above	0.11 left
	-AE1A5	TCM S6LN-204, S6LN-200	18.44	0.98 below	0.03 left
	HIO-540 -A1A	TCM S6LN-1227, S6LN-1209 or S6LN-1227	18.25	0.88 below	0.16 right
AEIO-540	-D4A5	TCM S6LN-200, S6LN-204	18.16	1.15 below	0.21 left
	-D4B5	TCM S6LN-1227, S6LN-1209	18.16	1.15 below	0.21 left
	-D4C5	TCM S6LN-1208, S6LN-1209	18.16	1.15 below	0.21 left
	-D4D5	Slick 6393, 6350	18.16	1.15 below	0.21 left
AEIO & IO-540-	-L1B5D	TCM D6LN-3000	17.19	0.77 below	0.16 right
AEIO-540	-L1B5	Slick 6351 (2), 6350 or 6351	17.19	0.77 below	0.16 right
	-L1D5	Slick 6351 (2), 6350 or 6351	17.19	0.77 below	0.16 right

*For alternate magnetos see latest Textron Lycoming Service Instruction (S.I.) 1443.

+ TCM formally Bendix

(#) No Alternator installed

NOTE 10. These engines incorporate provisions for absorbing propeller thrust in both tractor and pusher type installations.

NOTE 11. Refer to latest Lycoming Service Bulletin (S.B.) No. 369 for applicable inspection procedures of engines which have been operated above the specified max. continuous r.p.m. rating (except momentary overspeed as defined in S.B.).

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